

Color of colony: Aerial mass color in the Green color-series on yeast-malt agar and salts-starch agar.

Reverse side of colony: No distinctive pigment (grayed yellow or grayed yellow modified by green) on yeast-malt agar, oatmeal agar, salts-starch agar or glycerol asparagine agar; substrate pigment is not a pH indicator.

Color in medium: Melanoid pigments formed in peptone-yeast-iron agar. Pigments other than melanoids not formed in yeast-malt agar, oatmeal agar, salts-starch agar or glycerol-asparagine agar.

Carbon utilization: D-Glucose, L-arabinose, D-xylose, I-inositol, D-mannitol, D-fructose and rhamnose are utilized for growth. No growth or only trace of growth on sucrose. Variable reports on growth with raffinose.

Streptomyces hachijoensis Yamaguchi. Description: Yamaguchi 1954, 10-14. (Antibiotic activity described by Hosoya et al. 1952, 564; Hosoya et al. 1952, 505.) Type strain: H-2609 (Yamaguchi, ibid.). ISP 5114 from T. Yamaguchi as H-2609. ISP description by Group A-10.

Spore chain morphology: Section Verticillati. Both monoverticillate and umbellate monoverticillate (biverticillate) spore chains are found. Mature spore chains short, generally 3 to 10 spores per chain (Fig. 86). This morphology is seen on yeast-malt agar, oatmeal agar, salts-starch agar and glycerol-asparagine agar. Spore surface: Smooth (Fig. 85).

Color of colony: Aerial mass color in the Red color-series on yeast-malt agar, oatmeal agar, salts-starch agar and glycerol-asparagine agar.

Reverse side of colony: No distinctive pigment (grayed yellow to yellow-brown) on yeast-malt agar, oatmeal agar, salts-starch agar or glycerol-asparagine agar; substrate pigment is not a pH indicator.

Color in medium: Melanoid pigments not formed in peptone-yeast-iron agar and tyrosine agar. No pigment in medium, or only trace of yellow, in yeast-malt agar, oatmeal agar, salts-starch agar and glycerol-asparagine agar.

Carbon utilization: D-Glucose and I-inositol are utilized for growth. No growth or only trace of growth on L-arabinose, sucrose, D-xylose, D-mannitol, D-fructose, rhamnose and raffinose.

Streptomyces halstedii (Waksman and Curtis) Waksman and Henrici. Descriptions: Actinomyces halstedii Waksman and Curtis 1916, 124; Waksman 1919, 127; Streptomyces halstedii (Waksman and Curtis) Waksman and Henrici 1948, 953. Type strain: IMRU 3328 (Waksman, 1961). (See Hütter et al. 1961, page 177, for critical comment on IMRU 3328 as type culture.) ISP 5068 from S. A. Waksman as IMRU 3328. ISP description by Group A-6.

Spore chain morphology: Section Rectiflexibiles. Spore chains are predominantly flexuous, but many hooks and some irregular coils similar to RA morphology are found on yeast-malt agar and glycerol-asparagine agar. Spore chains are short, 3 to 10 spores per chain, on yeast-malt agar, salts-starch agar and glycerol-asparagine agar. Sporulation may be poor, especially on oatmeal agar. Since the original characterization by Waksman (1916) describes closed spirals 7-10 $\mu$  in diameter, the short flexuous or hooked chains may be atypical. Spore surface:

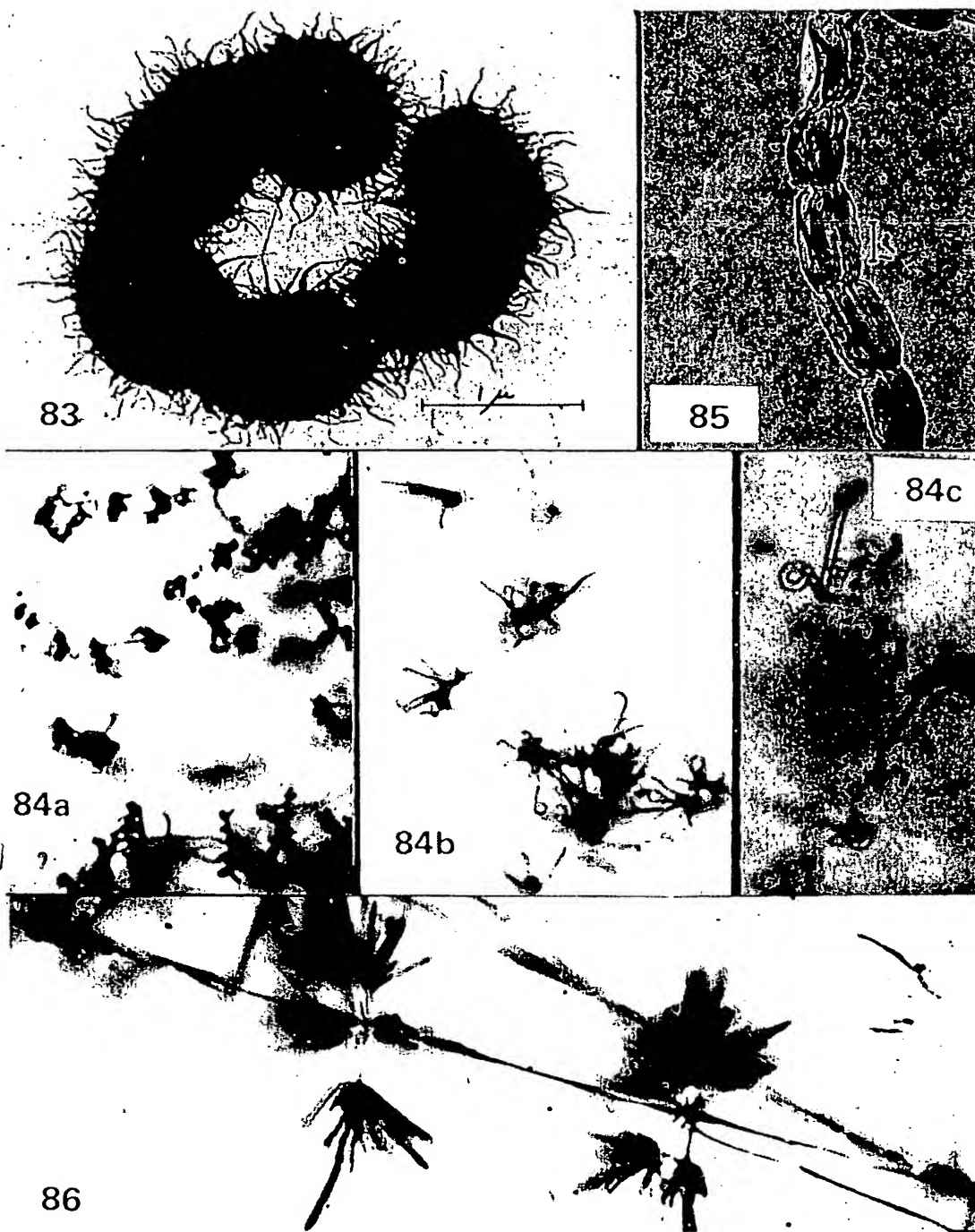


Figure 83. *A. griseostramineus*. Hairy to spiny spores; electron micrograph from 14 day culture on oatmeal agar.<sup>1</sup>

Figure 84. *A. griseostramineus*. (a, c) Tight spirals of few turns (300x, 900x) on yeast-malt agar, 21 days.<sup>23</sup> (b) RA morphology (300x) on yeast-malt agar, 14 days.<sup>22</sup>

Figure 85. *S. hachijoensis*. Carbon replica of smooth spores; electron micrograph from 10 day culture on yeast-malt agar.

Figure 86. *S. hachijoensis*. BIV (umbellate monoverticillate) morphology on glycerol-asparagine agar, 21 days.<sup>18</sup>